Multidimensional health modeling: Association between socioeconomic and psychosocial factors and health in Latvia

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Abstract

This research aims at estimating impact of socioeconomic and psychosocial factors on health outcomes in Latvia. We find empirical support for the association between psychosocial factors and health.

This paper proposes new approach for modeling health. We find that concept of health is too complicated to measure effects of health determinants using a one-dimensional model. We apply two-dimensional stereotype logistic model that allows capturing nonmonotonicity in effects of latent factors and revealing significant effects that would remain unseen if single dimension models, such as ordered logit or probit, were used.

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1. Introduction

Reducing socio-economic health inequalities is one of the main challenges within the public health sector in Europe. Measuring socioeconomic inequalities in population's health is important because national averages often mask differences within and across subgroups. For policy purposes it is especially relevant to understand why unfair and avoidable inequalities (or inequities) exist and what actions may be taken to improve equity.

Nature of health inequalities differs among EU member states. Consortium of Partners for Equity in Health admit that there is no a single rule for tackling health inequalities and country-specific data are essential to elaborate efficient policy. Only describing country-specific health inequities and understanding their determinants can aid in the development of policies, relevant to a particular context or country, to reduce inequities.

Health inequalities exist not only within, but also between EU Member States. There is a 10 year difference in life expectancy at birth between countries such as Sweden, Spain and Italy (81 years) on one hand and Latvia and Lithuania (71 years) on the other (WHOStat, 2008).

The variations in morbidity and mortality rates across the EU and the health gradient attest that health differences are not simply the result of unhealthy behaviors by individual choice but that they are rather a result of a variety of social, economic and environmental factors that are often beyond an individual's control. Since these factors can be addressed and the inequities deriving from them reduced, they are avoidable, "unfair and unjust" (Whitehead and Dahlgren, 2006).

Poor health indicators in Latvia show exigency of action to be taken both on tackling health inequalities and on promoting overall health level in this country. This in turn is not possible without country-specific information on health determinants.

Income, education, employment status, gender etc. are commonly seen as main health determinants. However comparatively recently interest was paid to so-called psychosocial factors or psychosocial resources.

This paper sheds light on sources of health inequalities in Latvia applying multidimensional analysis. We evaluate effect of so called 'classical' health determinants (social, economic factors) and also examine impact of various psychosocial factors on health of population of Latvia.

Association between health and psychosocial factors was revealed in numerous studies. Islam et al. (2006) identified 9 published articles on the link between individual access to social capital and individual health. After this Dunn et al. (2006) addressed questions concerning psychosocial processes in a study analyzing self-assessed socio-economic position and self-assessed health based on individual-level Canadian data. Lavis and Stoddart (2003) find social cohesion to be strongly correlated with health in Canada. Jusot et. al. (2007) provides evidence for association between set of psychosocial resources and self-assessed health in France. Iversen (2007) divides social capital into two groups – individual social capital and community social capital, finding positive association between health and voting participation in local elections as well as health and religious activity at the community-level in the cross-sectional survey conducted in Norway.

According to our preliminary research, a major part of population of Latvia is exposed to substantial psychosocial burden. For example, in 2005 more than a half of population of Latvia was suffering from high stress level or depression[1]. Level of life satisfaction in Latvia in 2003 was the lowest among EU-25 countries (Bohnke, 2005) and only slightly improved relatively to other countries in 2007 showing 4th lowest result among EU memberstates and the three candidate countries (Anderson et.al., 2008). Level of satisfaction with some basic

life domains was one of the lowest as well (Bohnke, 2005). This indicates that psychosocial burden in a case of its causality can aid to substantial health loss in the country.

In this paper we provide empirical support for the association between psychosocial factors and self-assessed health in Latvia. We do not try to present some fundamentally new psychosocial resources, however our view on some psychosocial factors slightly differs from one commonly used in health literature (for more please see the next section). We analyze impact of some psychosocial and emotional factors, including depression, civic trust, perceived sense of control over own life, life satisfaction (as an average from three basic life domains), optimism concerning expectations on own future and expectations on prospects of the social group one associates oneself with.

This paper will make novel contribution to modeling health. We see some possible problems in measuring impact of socioeconomic determinants on health using single-dimension models. First, we find that health might not be monotonically related to latent variables. If this is true, the model should be able to specify multiple equations to capture effects of those latent variables. Second, some health categories may be indistinguishable of hardly distinguishable. Since self-assessed health is often used as dependent variable in health models the problem is of potential interest. If some two health outcomes are in fact quite similar to respondent, he or she might be randomly picking between the two. One alternative is to combine these categories and use multinomial logistic model, however in this paper we offer to use more flexible alternative – a stereotype logistic model. This model allows indicating whether all categories are distinguishable and which are not. The model also provides possibility to measure effects of factors in more than one dimension. In this paper we use two-dimensional stereotype logistic model to estimate impact of socioeconomic determinants and psychosocial factors on self-assessed health of residents of Latvia.

The use of self-assessed health status as a measure of health is common in empirical research. However it was proved that standard health scale used in health surveys (very good, good, fair, poor, very poor) implies number of problems. Some studies proved that this scale of SAH implies heterogeneity bias. When both SAH and more objective health measures (clinical health) were used, it was found, for example, that in Canada and Britain for a given level of clinical health, lower income individuals are more likely to report poor level of SAH than higher income groups (Humphries and van Doorslaer, 2000; Hernandez-Quevedo et al., 2004). On the contrary, in Germany richer respondents tend to understate their health assessment (Jürges, 2008). Hence, the magnitude and the sign of reporting heterogeneity seem to be country-specific. In France reporting heterogeneity was found for the choice between the medium labels i.e. "fair" vs. "good" and for high-income individuals (Etile and Milcent, 2006). In USA given similar diagnosed health conditions and severity levels female respondents seem to rate their health levels (on a very good to poor health scale) lower than males; divorced, widowed or separated respondents seem to rate their health levels lower than married or never married respondents (Dodoo, 2006). Many authors admit that the very good to very poor SAH scale should be used cautiously for the assessment of health inequalities.

Another problem of the very good to very poor health scale is its nonstability (Crossley and Kennedy, 2000). People often face difficulties in assessing their health in terms of good/fair or fair/poor health and are usually randomly picking between two categories.

In our research we use less subjective SAH scale which allows minimizing reporting bias and respondent's perception odds thus helping to provide more reliable results for self-assessed health status.

Some authors try to avoid mentioned SAH bias using binary logit or probit models for dichotomized multiple-category responses and comparing respondents with good health to those who report their health to be "less than good" (Etile and Milcent, 2006; Mackenbach,

2006; Jusot et.al., 2007; Jürges, 2008). But it obviously results in a loss of information and requires the introduction of an arbitrary cutoff point (Wagstaff and van Doorslaer, 1994). Another popular approach is modeling health using ordered logit and probit models (van Doorslaer and Jones, 2003; Bockerman and Ilmakunnas, 2007; Bos and Bos, 2007; Iversen, 2007). Both principles find support in handbook for health researchers by WHO and IBRD for surveys that use SAH as dependent variable (O'Donnell et.al. 2008). In this paper we introduce another approach that, from one side, at least to some extent helps to identify the above discussed reporting bias and, from the other side, doesn't ignore nonmonotonicity problem.

According to our best knowledge, the phenomenon of nonmonotonicity hasn't been discussed in this field before. In this paper we will show that health is nonmonotonically related to some latent variables which implies restrictions on use of ordered logit and probit models.

2. Data and Methodology

This research is based on population survey (representative of the Latvian population) conducted in March-April 2008. The survey has covered residents of all regions of Latvia aged 15 to 74; in our analysis we use only adults, i.e. respondents aged 18-74.

Data were collected by face-to-face interviews. While information is available only for one household member, the dataset has enough valid observations for our purposes. After omitting all observations with missing values for health and respondents below 18 we obtain a sample of 921 observations.

Self-assessed health is used as a dependent variable. Respondents were asked to answer the question "Which statement describes state of your health most precisely?" choosing one of six possible answers: "I never ail/ ail very rarely", "I have had only minor sicknesses", "I have

had serious sicknesses that are cured", "I have had serious sicknesses, injuries and I still suffer from them", "I have chronic diseases", "I am disabled[2]". We use a five point scale for our model, combining the last two categories (the last category is quite small – 4.1%; furthermore according to our preliminary findings the last two groups are not statistically different).

Using stereotype logistic model we will estimate impact of socioeconomic determinants and psychosocial factors on health outcomes in Latvia. List of socioeconomic determinants includes gender, age, labor status, marital status, household income (per capita), education, place of residence and ethnicity (see Table A1 with descriptive statistics for dependent variable and factors).

In our paper we also assess association between health and some psychosocial factors. The first psychosocial factor examined indicates presence of serious emotional problems (depression, nervousness) that have been experienced during last year and caused problems at work or in everyday life. To be short and simple we will call this factor "depression", however we acknowledge that psychologists might argue – depression is a really serious disease that is much more important than the state we call "depression" in our everyday life and that was used in terms of the population survey.

The next factor describes person's life satisfaction or being more precise person's average level of satisfaction with three life domains: present job/studies[3], family life, own and family's material well-being. The life satisfaction index consists of three categories – high, average and low level of satisfaction. Life domains used in the index can be seen as basic domains that determine overall life satisfaction level in Latvia since the three domains have the strongest effect on overall life satisfaction of residents of Latvia among 24 different life domains (Hazans, 2006). These domains are also marked out by the European Foundation for

the Improvement of Living and Working Conditions (Bohnke, 2005) as main domains that contribute to overall life satisfaction.

In distinction to some other authors who examine impact of psychosocial side of life on health using sense of control at work (Bobak et. al., 2007; Jusot et. al., 2007), in this paper we analyze perceived sense of control on own life in whole. Respondents provided their evaluation of perceived control on their own lives on a 10 point scale. We divide the scale into 3 parts to have three categories of the variable: low level of control (1-5), average (6-7) and high level of control (8-10). Missing values and "hard to say" are included into additional category to avoid loss of observations.

Civic trust is another factor included into the list of psychosocial factors examined in this research. Respondents were offered a 10 point scale to evaluate whether people can be trusted (10) or one should to be very cautious in relations with people (1). Like in a case of sense of control we have three categories of the variable: low level of trust (1-5), average (6-7) and high level of trust (8-10).

We also test whether optimistic (or pessimistic) view of own future and country development affects person's health. Here we use direct and indirect measures to test possible impact of respondent's expectations on own life – self-assessed prospects of changes in quality of own life and anticipated changes in quality of life of a group of people one associates oneself with ('people like you') within next 2-3 years.

As it was already mentioned, stereotype logistic regression model (Anderson, 1984) applied in this research allows specifying multiple equations to capture the effects of some latent variables. Unlike with multinomial logit, the number of equations one specifies could be less than m-1, where m is the number of categories of the dependent variable.

In the multinomial logistic model, you estimate m-1 parameter vectors β_k, k=1 … m-1. In the stereotype logistic model there are d parameter vectors, where d is between one and min(m-1, p), and p is the number of regressors. The relationship between the stereotype model's coefficients β_j, j=1 … d, and the multinomial model's coefficients is

$$\beta_k = -\sum_{j=1}^{d} \phi_{jk} \beta_j \,. \tag{1}$$

The ϕs are scale parameters to be estimated along with the $\beta_j s$.

Given a row vector of covariates x, let $\eta_k = \theta_k - \sum_{j=1}^{d} \phi_{jk} x \beta_j$.

The probability of observing outcome k is

$$\Pr(Y_i = k) = \begin{cases} \dfrac{\exp(\eta_k)}{1 + \sum_{l=1}^{m-1} \exp(\eta_l)} & \text{k < m} \\ \dfrac{1}{1 + \sum_{l=1}^{\text{m-1}} \exp(\eta_l)} & \text{k = m.} \end{cases} \tag{2}$$

If d=m-1, the stereotype logistic model is just a reparameterization of the multinomial logistic model. To identify the ϕs and the βs, at least d^2 restrictions on the parameters are essential. By default stereotype logit uses the "corner constraints" $\phi_{jj} = 1$ and $\phi_{jk} = 0$ for j ≠ k, k ≤ d, and j ≤ d (StataCorp LP, 2005).

3. Results

The model designed analyzes two different dimensions the factors act through. This allows revealing nonmonotonicity in effects of some variables and capturing significant effects of some factors that would be seen as statistically insignificant if a single dimensional model was used.

The first dimension of the model describes effects of factors when the second health outcome (Might have only minor sicknesses) is compared to the first health outcome (Never ails/ ails very rarely) (see Table A 3 in the Appendix). The effects of second dimension are measured so the third health outcome and further (Has had serious sicknesses that are cured, Has had serious sicknesses, injuries and still suffers from them, Has chronic diseases/ is disabled) is compared to the base outcome, i.e. the first health outcome (Never ails/ ails very rarely). Equal coefficients for the fourth and the fifth outcomes in the second dimension state that difference between the categories is statistically insignificant. This might indicate that the two categories are hardly distinguishable and respondents may be randomly picking between them.

3.1. Association between Health and Socioeconomic Determinants

Table 1 presents results for stereotype logistic model designed to estimate impact of socioeconomic factors on health outcomes. Marginal effects show increase or decrease of probability of according health outcome for each factor after accounting for all other factors (precise levels of significance are provided in Table A 4). Categories of each variable are compared to reference category given in brackets. Percent above each health category shows average probability of according health outcome. To be simple and to avoid too long expressions further we will use definition “very good health” to describe group of respondents who never ail / ail rarely, “good health” will be used to describe those who have had only minor sicknesses etc. However please bear in mind that the original scale used in the survey was not a very good to very poor health scale.

Table 1 about here

Most studies addressing self-assessed health in different countries record large gender differences with women reporting significantly worse health than men (Walters and Suhrcke, 2005). Gender health gap is observed in Latvia as well with lower self-assessed health parameters for females[4]. However we do not find statistically significant difference between male and female health in none of the dimensions when all other socio-economic factors are controlled (see Table 1). This means that despite in absolute terms gender disparities are still actual in Latvia, the source of these disparities is found in unequal distribution of favorable socio-economic factors and psychosocial resources, as well as in different impact of specific variables on male and female health. According to the model developed, marital status and psychosocial factors are in the list of such factors. Effects of these factors are described below.

Place of residence affects male and female health in a different manner as well. In the model we compare residents of Riga and Riga region to those who live outside the region. The analysis might be more interesting than urban-rural comparison since economic activity in Latvia is highly concentrated in Riga and about a third of all residents of Latvia live in this city (the number of residents in the second greatest city of Latvia is 5-6 times smaller than in Riga).

While the difference between health prospects between women living in Riga or Riga region from one side and women living outside the region from the other side is not observed, effect of place of residence for male representatives is rather strong. According to the results, the variable is nonmonotonically related to health and its effect is significant only in the first dimension: male residents of Riga have greater chance to have very good health (other parameters equal), but lower probability of good health. Moving further on the health scale (in the second dimension of the model), impact of place of residence is not significant.

The effect of the place of residence variable might have its rise in the process of labor force migration that was quite active within last years – major part of young active people living in regions of Latvia (Kurzeme, Vidzeme, Latgale) has moved to the capital or abroad, which resulted in increase of proportion of very healthy males in the capital and its region and decrease of proportion of such males in other regions. However this still doesn't provide a comprehensive explanation for the negative effect the place of residence variable has for the second health outcome. Deeper analysis that is out of means of the survey data needed to be applied to study the source of this phenomenon.

Results of the model developed confirm rather obvious statement that health is strongly related to age. In this model we use three age variables – linear, squared and cubed. Significance of effects for all the three variables proposes presence of two bending points in the effect of age; these points are found at about 30 and 60 years with an increasing rate of health loss after 30 years and decreasing rate after 65. The second effect to some extent might be explained by survivor bias – those who have reached age of retirement can be characterized by comparatively strong organism which reduces health risks and health loss.

Despite marriage is generally considered to be positively related to health, we find no statistically significant difference in health between married (or living with partner) and those who are single. No empirical evidence for a significant positive association between SAH and being married was found for residents of Germany and Norway as well (Iversen, 2007; Jürges, 2008).

At the same time we see a negative effect for divorced and widowed females. The effect for divorced and widowed males is not statistically significant, although this might be due to small size of the group in the sample. The dummy variable for divorced and widowed females is nonmonotonically related to health – the effect is not significant for very good health, but is significant for all the other outcomes.

The status of divorced or widowed has rather strong negative effect for females – the probability of good health decreases by 21.5 percent points (which is impressive taking into account that average probability of this health outcome is 32%). According to our preliminary findings, the third health outcome (fair health) can be seen as the one closer to poor health rather than to good health. According to this we can see that being a divorced or widowed female has a negative effect also when the third and further health outcomes are considered – the probabilities of these outcomes for the group are higher (after excluding impact of all other factors).

Absence of negative impact of status of divorced or widowed for the females in case of very good health can be explained as follows: very healthy women might go through negative psychological and economical effects that divorce may have relatively easier than less healthy women. When health is already undermined, impact of such burden may be noticeably stronger. Healthy women obviously are more confident about themselves in terms of prospects for future marriage, job opportunities etc. That's why divorce in healthy women's life might not provide negative effect as it does for less healthy females.

We find significant differences in health between employed and economically inactive residents[5]. Strong association of economic activity and health has been observed in Latvia also in late 1990s (Monden, 2004). As the model results propose, status of economically inactive still has a particularly strong negative effect on health. The probability of very good health for the group is 23.3 percent points lower than for employed and students which is oppressive taking into account that the average probability of very good health is 29%. The effects for poor and very poor health are negative and strong as well. Impact of this variable (economical inactivity) is one of the strongest among the factors considered.

The effect of status of unemployed is not seen as statistically significant. Absence of a statistically significant effect can be explained by fact that job possibilities in that period

(spring 2008) were rather good, and a large part of those found in this group were frictional unemployed. Rate of unemployment in spring of 2008 was rather low (for Latvia) – about 6.3%[6] (Central Statistical Bureau of Latvia, 2010) and shift from one job to another or short term unemployment didn't provide negative impact on health then. One can be sure that if the survey was conducted a year later (not in April 2008, but in April 2009), the negative effect would be strong taking into account high unemployment rates in April of 2009 – 16,7%[7] (Central Statistical Bureau of Latvia, 2010) and serious economical and psychological burden experienced by unemployed in 2009.

We have also tested whether retirement has a statistically significant impact on health; however when labor status with the three categories is controlled for (one of this categories is economically inactive, which includes nonworking retirees), dummy for status of retired isn't significant for none of the health outcomes.

According to the model results, we find no statistically significant difference between non-Latvians and Latvians when all other socio-economic factors are controlled. In 1990s ethnic differences were not found for self-assessed health in general; however some gap still was found for long-standing health problems among women (Monden, 2004). In absolute terms (i.e. without control for other factors), however, just as in 1990s Latvians have slightly better health[8]. Obviously these differences have their rise from other socio-economic circumstances.

Level of education has a significant effect on population health in Latvia (impact of all other factors is excluded). In late 1990s impact of education was less noticeable; after adjusting for income, educational differences were significant only for women (Monden, 2004). In 2008 we do not find statistically significant difference in impact of education on self-assessed health between males and females (other factors controlled).

According to the model, the difference between residents with higher or incomplete higher education and a group of population with lower than secondary education is not significant for the extreme outcomes, but it is considerable when we analyze good and fair health: we observe strong negative effect (decrease of probability of good health and increase of probability of fair health) for residents with lower that secondary education.

According to the obtained results, higher education doesn't seem to provide advantage in chances to maintain good health in comparison to secondary education in Latvia (other parameters controlled). Quite the contrary – despite one's expectations, the effect of higher education here is even negative, i.e. those with secondary or vocational secondary education have greater probability of very good health than those with higher or incomplete higher education. The difference between secondary or vocational secondary education and those with higher or incomplete higher education is statistically significant only for very good health.

Support for negative effect for less educated (below secondary education) is mostly shown in the health economics literature (Jusot et. al., 2007; Jürges, 2008). In Latvia the negative effect we observe for the group of residents with lower than average education and relative advantage of those with secondary education in comparison to the most educated partly can be explained by differential exposure to serious emotional problems like depression, unrest etc. (see Figure 1). According to the survey data, residents with secondary or vocational secondary education are exposed to depression and stress less often than the other two groups; representatives with lowest level of education report having the greatest level of exposure to the risk.

Figure 1 about here

We do not find convincing empirical support for less educated to have more pronounced adverse behavior in comparison to residents with secondary education in Latvia. However another possible explanation for the less favorable state of residents with higher education could be found in more intensive work life and less time devoted for rest (see Figure 2). As we see, residents with higher and incomplete higher education on average devote to rest less time the other two education groups which reduces prospects of the former for very good health.

Figure 2 about here

In this paper we do not examine impact of income since data on income obtained in the survey were not persuasive – level of income was underreported and to avoid presenting misleading results we do not analyze income here. However income is still controlled in each model included into this paper. According to earlier research, income effect is significant in Latvia, however impact of income seems to be to a great extent associated with access to psychosocial resources; thus when psychosocial factors are controlled for, income effect becomes insignificant (Zujeva, 2008).

3.2. Ordered Probit vs Two-Dimensional Stereotype Logit determinants

Table 2 presents comparison of two models – ordered probit and two-dimensional stereotype logit. Since ordered probit assumes that dependent variable is monotonically related to factors, while stereotype logistic model allows for nonmonotonicity in effects of some latent

variables, we see obvious difference in results of the two models. For example, according to the stereotype model we find that effect for males who live outside the Riga region is particularly strong for the two first health outcomes (very good and good health). The model proposes that the variable is nonmonotonically related to health: the effect changes its sign – from positive effect on very good health to negative on probability of good health, but moving further on a health scale it doesn't provide a significant impact. In the ordered probit model the effect of the variable is seen as significant as well, however the model distributes the effect along the health scale showing completely different association between health and the factor.

Table 2 about here

Thanks to multidimensional approach stereotype logistic regression is able to grasp significant effects for some variables that would be seen as statistically insignificant if a single-dimension model was used. For example, in our model ordered probit is not able to reveal significance of the effect of being divorced or widowed for females. The similar picture is for the effect of below secondary education: according to the stereotype logit model, the difference between below secondary education and higher or incomplete higher education is statistically significant only for the two middle outcomes (good and fair health). Due to this reason the effect is not disclosed by ordered probit model.

In case of secondary and vocational secondary education, ordered probit reveals the effect as statistically significant, however it seems to be underestimated (in comparison to the stereotype logit model) for the first health outcome and spread further along the scale, while stereotype logit reveals significance of the factor only for very good health.

When a latent variable is monotonically related to dependent variable, stereotype logit model and probit model provide similar results as it is, for example, for the variable of labor status and effect for economically inactive residents.

Thus we can see that a multi dimensional approach allows revealing nonmonotonicity in effects of some latent variables, disclosing significant effects for some variables that cannot be seen when a single-dimension model is used, and together with that it allows estimating effects more accurately.

3.3. Association between Health and Psychosocial Factors

The model presented in Table **3** introduces effects of two psychosocial factors – life satisfaction (calculated as average level of satisfaction with three domains – job/studies, family life, own and family's material well-being) and perceived sense of control over one's life.

We see that low value of index of life satisfaction shows strong negative effect on health – those with average and high level of life satisfaction have considerably greater chances to maintain very good health and have much lower probability of fair, poor or very poor health in comparison to those less satisfied.

As the model proposes, gender differences in effect of life satisfaction level are observed: the positive effect of high life satisfaction level is not that strong for females when very good health is considered, however already for good health (and fair health) the positive effect is particularly strong – in case of high life satisfaction level the probability of good health goes up by 33.3 percent points and probability of fair health (which is closer to poor health rather than to good health) goes down by 9.6 percent points.

Table 3 about here

Association between sense of control and self-assessed health was revealed in some previous researches; however authors mostly turn their attention to sense of control at work (Bobak et. al., 2007; Jusot et. al., 2007). As it was already mentioned above, in this paper we analyze impact of sense of control over own life on self-assessed health.

Association between health and perceived sense of control over own life has some different nature than association between health and level of life satisfaction described above. From one side, just as it was in case of life satisfaction, those with average and high level of control have greater chance to keep good health and lower probability of poor health outcomes. At the same time there are some peculiarities in effect of the sense of control variable. For males high level of perceived control is associated with lower chances to maintain very good health in comparison to average level of control. In turn for females high level of perceived control provides negative effect in case of good to very poor health outcomes. Such phenomenon can be explained as follows: high level of control over one's life should be associated with greater intellectual and emotional efforts, harder work etc., which might result in some health loss. For females necessity to be very strong and try to control all life domains might become a burden rather than a positive factor. This could at least to some extent explain the negative effect we observe for females with high perceived control over own life.

The model proposes that the two psychosocial factors described – level of satisfaction and perceived control over life – affect health mediating with some other factors. Thus negative effect we observe for divorced and widowed females for poor and very poor health outcomes becomes insignificant when the psychosocial factors are controlled for. One can make a

conclusion that increase of probability of poor and very poor health in this group of females is to a great extent associated with psychosocial burden.

Negative effect for economically inactive residents described in section 3.1. reduces as well when life satisfaction and sense of control are added to a model. This suggests the fact that the lower health parameters of representatives of this group are related to their psychosocial state.

The health model developed for employed population in France by Jusot et. al. (2007), shows that increase of probability of ill health in case of primary education becomes insignificant after adding psycho-social factors into the model. In contradiction to this our model proposes that volume of effects of education variable becomes stronger when life satisfaction and sense of control are included into the model. As is shown in the Table 3, residents of Latvia with higher or incomplete higher education have lower chances for very good health in comparison to other groups if we assume that all other socio-economic and psychosocial factors are equal.

A separate endogeneity test (Rivers and Vuong, 1988) was conducted for each variable (life satisfaction index and sense of control). Two-step probit with instrumental variables was used for this purpose (see results in Table A 8, Table A 9, Table A 10 and Table A 11) for the two dimensions of the model: the first dimension – good health is compared to very good health; the second dimension – fair, poor and very poor health outcomes are combined into one category and compared to very good health. Two variables were used as instruments for the test of life satisfaction variable: respondents' reported satisfaction with possibilities to implement personal ideas and plans and expectations on living standards in Latvia within 2-3 years in comparison to EU average. Both variables have significant impact on level of life satisfaction. Satisfaction with possibilities to implement personal ideas and satisfaction with own professional qualification variables were used as instruments for endogeneity test of perceived control over life. All mentioned instrumental variables have significant impact on 'suspicious' factors and are positively related to them. At the same time none of the

instrumental variables has statistically significant impact on health when included into the model.

The theoretical ground for choice of the instrumental variables can be as follows: one is not likely to be really satisfied with job and family life if both do not leave a chance to implement personal plans. Thus satisfaction with possibility to implement personal ideas and plans should be positively related to satisfaction with job and family life. Another variable, e.g. pessimistic expectations on changes of life quality in Latvia, can have twofold action. If one's expectations on overall future life prospects in Latvia are pessimistic, this should have some moral pressure and reduce life satisfaction level. From the other side pessimistic attitudes as such should be negatively related to possibilities to reach success in various life domains ("They can, because they think they can", Publius Vergilius Maro).

Turning to sense of control and relationship between the factor and instrumental variables, one could note that lack of possibility to implement personal ideas and plans should mean great pressure of external factors that are out of one's control; this would have negative impact on person's sense of control over own life (and otherwise). Higher level of satisfaction with one's professional qualification provides greater job opportunities, better prospects of professional growth, higher income level etc., which have positive impact on one's perceived sense of control.

The hypothesis of exogeneity was not rejected for both factors (life satisfaction and sense of control).

In this paper we have also examined impact of another psychosocial factor on health – expectations on living standards of people one associates himself with ('people like you') (see Table 4). Respondents were asked about their anticipated changes in living standards of the group person feels belonging to in the next 2-3 years. We analyze this variable since it should

indirectly provide anticipated changes in person's own position from one side and should allow avoiding endogeneity from another side.

After accounting for socioeconomic factors, those with optimistic vision of future prospects of the group they associate themselves with show strong positive effect on health in comparison to the other groups, however the difference is significant only in case of very good health. The effect can be interpreted as follows: from one side, positive future prospects provide noticeable emotional animation that can drive one's state of health up (prevent from or smooth some other negative factors), however the positive effect on health state can be strong enough and observed only when a person still has very good health; from another side, optimistic on their nature people have greater chances to have very good health from physiological point of view for a number of different reasons; for example, such people are less often exposed to depression, nervousness etc., as a consequence they have less need for smoking and alcohol as measures for reduction of negative pressure of external factors etc.

Psychosocial factors can affect health directly, through a biological pathway, or indirectly, through a behavioural one (Evans et. al., 1994; Marmot and Wilkinson, 2005). Association between psychosocial problems and adverse health behaviours was highlighted in a recent study by Bobak et al. (2005) showing a significant inverse relationship between the effort/reward balance at work and all indicators of alcohol consumption and problem drinking in Novosibirsk (Russia), Krakow (Poland) and Karvina (Czech Republic). What according to biological pathway, it was scientifically proved, that stress, fear, depression and similar psychological states stimulate production of adrenocorticotrophic hormones that increase probability of heart attacks and even cancer (Kvetnoy and Konovalov, 2004).

Table 4 about here

In contradiction to what we have seen for life satisfaction and sense of control, we do not find statistically different impact of expectations variable on male and female health. However as one can see, when expectations factor is controlled, we find the effect for the group of single females to become statistically significant.

The expectation variable was also tested on endogeneity using two instruments – expectations on living standards in Latvia within 2-3 years in comparison to EU average and satisfaction with job possibilities in a region one lives in. As it can be seen from Table A 12, exogeneity of expectation variable was not rejected. It was not rejected also when the factor was tested using one instrument only (expectations on living standards in Latvia); however test results are slightly more convincing when two instruments are used.

Another expectation variable which was mentioned in the second section as a direct measure of expectations on own life – expectations on changes in own life quality – are not analyzed in this section since exogeneity of the factor was rejected.

The test on endogeneity was implemented also for the depression variable. It was instrumented by two variables that have significant impact on depression – satisfaction with possibilities to implement personal ideas and plans and expectations on living standards in Latvia within 2-3 years in comparison to EU average. As it was already mentioned above, both instruments do not have statistically significant impact on health. According to the test results one cannot exclude endogeneity of the depression variable. Due to this reason the model with this variable is not presented in the paper.

Another variable that will not be analyzed in this paper is civic trust. Appropriate instrument to test the variable was not found in the questionnaire; moreover the factor when included into

the model doesn't provide interesting and persuasive results. According to this we will omit analysis of impact of civic trust on health outcomes in Latvia.

Social capital and other psychosocial factors are often perceived as determinants of mental health (Kawachi and Berkman, 2001; McKenzie et. al., 2002). However the models developed in this research provide empirical support for association between psychosocial factors and self-assessed (physical) health in Latvia. According to the obtained results, this association is particularly strong.

Unfavorable psychosocial factors could be seen as a major health risk in Latvia even before crisis and should be treated even more seriously in terms of present economic situation. As it was already mentioned above, in 2003 Latvia has shown one of the lowest life satisfaction levels within EU (Bohnke, 2005), in 2007 the situation was only slightly better – Latvia has shown 4th worst results among EU memberstates and three candidate countries (Anderson et.al., 2008). Last economic tendencies in the country allow making an assumption that in 2009 the situation hasn't improved or might even deprive (both in absolute terms and comparatively to the other EU countries). Since we observe strong negative effect of low life satisfaction, the long term low life satisfaction level might result in substantial health loss, especially in certain social groups. One third of adult population in Latvia evaluates their ability to control own life as low[9], which as the model proposes has negative consequences for physical health. Lack of optimistic attitudes and pessimistic evaluation of future prospects result in lower chances to keep good health as well. According to the survey results about a third of adult population was exposed to depressive states in spring of 2008 and we believe that the number in 2009 if measured would be even more dramatic. All above mentioned allows us making a conclusion that psychosocial burden should be perceived as a major risk factor in Latvia not only due to its exposure among the society, but also due to its strong association with population health.

4. Summary and conclusions

The two-dimensional stereotype logistic model presented suggests that concept of health is too complicated to measure impact of health determinants in a single dimension – some effects remain unrevealed or underestimated if one-dimensional models, e.g. ordered logit or probit model, are used. Moreover we observe nonmonotonicity in association between health and some latent variables which can be shown only when multidimensional effects of factors are analyzed.

We have examined impact of economic, social and psychosocial determinants on population health in Latvia. In contradiction to what is mostly found in other countries and is shown in the literature, in Latvia gender health disparities as such were not detected (holding all other parameters equal). However in absolute terms gender health inequalities are still observed in Latvia, which may be explained by differential access to socio-economic and psychosocial resources for man and women as well as by different nature of impact of some factors on male and female health: according to the obtained results, marital status, place of residence, life satisfaction and sense of control over life have different effect on male and female health.

In our models we use three variables for age – linear, squared and cubed; this proposes existence of two binding points in the effect of age and different rate of health deprivation – increasing rate of health loss after 30 years and decreasing rate after 65 years.

The model reveals significant disparities between economically inactive residents and a group of employed and students with strong negative effect for former (other parameters equal). Expected negative effect for unemployed in April 2008 was not revealed due to some reasons stated above.

The model developed uncovers strong negative effect for widowed or divorced females; the effect is nonmonotonic and can be revealed only when multidimensional model is used – results of ordered logit model, for example, do not provide evidence of significant effect for the group. The same can be said about the difference between the group of less educated (below secondary education) and those with higher or incomplete higher education; the disparities are revealed as statistically significant only when multidimensional analysis is applied. According to the results of the two-dimensional stereotype logit model the effect for secondary education is nonmonotonic and is significant only for very good health; the ordered probit model in turn underestimates the effect for very good health and spreads the effect of the variable along the health scale.

The model developed suggests that difference between residents of Riga and Riga region and the rest part of population is observed only for males and is significant only for very good and good health outcomes; the effect can be revealed only applying a multidimensional model.

The models developed propose that psychosocial factors may be of central interest when one analyzes determinants of health in Latvia. The association between self-assessed health and the three psychosocial factors analyzed – life satisfaction, perceived control over own life and optimism – is significant and particularly strong. Relationship between the former two factors and health differs for males and females.

The paper accentuates that tackling health inequalities in Latvia should involve tackling not only income, education, occupation or other 'classic' inequalities, but also inequalities in access to psychosocial resources. The paper provides new evidence about the importance of psychosocial factors in explaining individual differences in health and improving population health in Latvia.

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Norbalt II survey data

Life quality in Latvia 2005 survey data

Health Survey 2008 data

Appendix.

Table A 1. Descriptive statistics: socio-demographic characteristics of the sample

Characteristics	Items	N (unweighted)	% (weighted)
Self assessed health	I never ail	286	29%
	There might be only minor sicknesses	294	32%
	I have had more serious illnesses that have been cured	137	15%
	I have had serious illnesses or injuries, and I still suffer from them	85	10%
	I have chronic illnesses	86	10%
	I am disabled	33	4%
Gender	Male	429	46.5%
	Female	492	53.5%
Age	18-24	238	15.8%
	25-34	145	18.4%
	35-44	147	16.3%
	45-54	163	20.4%
	55-64	106	14.6%
	65-74	122	14.4%
Place of residence	Riga and Riga region	623	31.0%
	Outside Riga region	239	69.0%
	Males living in Riga or Riga region	119	12.6%
Labour status	Employed / student	677	71.1%
	Economically inactive	195	23.0%
	Unemployed	49	5.9%
Marital status	Married / lives with partner	513	60.5%
	Single	270	22.5%
	Divorced / lives separately / widowed	138	17.0%
Ethnicity	Ethnic Latvian	623	58.2%
	Ethnic non-Latvian	298	41.8%
Education	Below secondary education	180	19.8%
	Secondary / vocational secondary education	477	52.5%
	Higher / incomplete higher education	255	26.4%
	Unknown	9	1.2%
Household income per capita	I quintile	159	17.3%
	II quintile	138	15.0%
	III quintile	159	17.3%
	IV quintile	148	16.1%
	V quintile	146	15.9%
	Unknown	171	18.6%

Table A 2. Descriptive statistics: psychosocial determinants of health

Characteristics	Items	N (unweighted)	% (weighted)
Life satisfaction index Average level of satisfaction with ... your current job (studies) in general ... your family life ... your and your family's material well-being	Low level of satisfaction	261	30.0%
	Average level of life satisfaction	484	52.3%
	High level of life satisfaction	169	17.1%
	Unknown	7	0.6%
Sense of control Please, evaluate, to what extent you control your own life? Please, give your evaluation on scale from 1 to 10, where "1" means – "I don't have influence on it at all", "10" – "I have great influence on it".	Low level of control (1-5)	270	30.4%
	Average level of control (6-7)	265	28.8%
	High level of control (8-10)	375	39.3%
	Unknown	11	1.4%
Expectations on living standards of the group To your mind, within the next 2-3 years living standards of people like you in Latvia...	Will improve	296	29.7%
	Will remain on the same level	252	27.5%
	Will be worse	277	32.2%
	Unknown	96	10.6%
Depression During the last year, have you had serious emotional problems (depression, anxiety, unrest) which caused problems at work or in everyday life?	No	540	57.5%
	Hard to say	90	10.0%
	Yes	291	32.6%
Civic trust To your mind, can people be trusted or one should to be very cautions in relations with people? Please, give your evaluation on scale from 1 to 10, where "1" means – "One should be very cautious in relations", "10" – "People can be trusted".	Low level of trust (1-5)	560	60.1%
	Average level of trust (6-7)	242	26.2%
	High level of trust (8-10)	111	12.6%
	Unknown	8	1.1%

Table A 3. Scale parameters of two-dimensional stereotype logistic model

1st dimension	/phi1_1	Never ails/ ails very rarely	0	(base outcome)
	/phi1_2	Has had only minor sicknesses	1	
	/phi1_3	Has had serious sicknesses that are cured	0	
	/phi1_4	Has had serious sicknesses, injuries and still suffers from them	0	
	/phi1_5	Has chronic diseases/ is disabled	0	
2nd dimension	/phi2_1	Never ails/ ails very rarely	0	(base outcome)
	/phi2_2	Has had only minor sicknesses	0	
	/phi2_3	Has had serious sicknesses that are cured	1	
	/phi2_4	Has had serious sicknesses, injuries and still suffers from them	1.9	
	/phi2_5	Has chronic diseases/ is disabled	1.9	

Note: See formulas 1 and 2 at page 7.

Table A 4. Impact of socioeconomic factors on health outcomes in Latvia (two-dimensional stereotype logistic regression)

Factors	**Impact of each factor on health outcomes** (comparison with the reference category, impact of other factors is excluded)									
Mean probabilities	29%		32%		15%		10%		14%	
	Very good Never ails/ ails very rarely		**Good** Has had only minor sicknesses		**Fair** Has had serious sicknesses that are cured		**Poor** Has had serious sicknesses, injuries and still suffers from them		**Very poor** Has chronic diseases/ is disabled	
	dP/dX	Sig.	dP/dX	Sig.	dP/dX	Sig.	dP/dX	Sig.	dP/dX	Sig.
Female	1.6%	0.752	-1.8%	0.725	0.4%	0.806	-0.1%	0.972	-0.1%	0.972
Lives in Riga or Riga region (ref. cat.: lives outside Riga region)	0.5%	0.914	4.6%	0.433	-1.7%	0.359	-1.4%	0.409	-2.1%	0.409
Lives in Riga or Riga region, male (dummy)	**19.6%****	0.019	**-17.2%*****	0.004	2.1%	0.477	-1.8%	0.445	-2.7%	0.451
Age	**7.8%****	0.020	-5.0%	0.131	0.5%	0.647	-1.3%	0.244	-2.0%	0.243
Age^2/100	**-21.4%*****	0.007	10.7%	0.181	-0.4%	0.886	**4.5%***	0.086	**6.6%***	0.084
Age^3/1000	**1.6%*****	0.006	-0.8%	0.209	0.0%	0.956	**-0.4%***	0.058	**-0.5%***	0.056
Single (ref. cat: married or lives with a partner)	-3.9%	0.522	3.4%	0.644	-0.6%	0.803	0.4%	0.866	0.7%	0.866
Single, female (dummy)	2.2%	0.798	-11.3%	0.117	3.5%	0.173	2.3%	0.527	3.4%	0.523
Divorced or widowed , female (dummy)	4.8%	0.500	**-21.5%*****	0.000	**6.5%*****	0.000	**4.1%***	0.099	**6.1%***	0.097
Economically inactive (ref. cat: employed / students)	**-23.3%*****	0.000	**-10.6%***	0.063	2.5%	0.347	**12.7%*****	0.000	**18.7%*****	0.000
Unemployed	-2.3%	0.757	-8.9%	0.195	3.1%	0.151	3.3%	0.284	4.8%	0.280
Ethnic non-Latvian	-2.2%	0.545	4.6%	0.236	-1.3%	0.291	-0.5%	0.685	-0.7%	0.684
Below secondary education (ref. cat: higher / incomplete higher education)	8.1%	0.158	**-19.4%*****	0.000	**5.4%*****	0.002	2.4%	0.242	3.5%	0.239
Secondary / vocational secondary education	**6.8%***	0.075	-2.5%	0.584	-0.2%	0.909	-1.7%	0.256	-2.5%	0.263

Notes: Asterisks *, **, *** indicate a statistically significant difference from the base group at 10%, 5%, 1% level respectively.
Other factors controlled: income

Table A 5. Impact of socioeconomic factors on health outcomes in Latvia – comparison of results for two-dimensional stereotype logit model and ordered probit model

Factors		**Impact of each factor on health outcomes** (comparison with the reference category, impact of other factors is excluded)									
Mean probabilities		29%		32%		15%		10%		14%	
		Very good Never ails/ ails very rarely		**Good** Has had only minor sicknesses		**Fair** Has had serious sicknesses that are cured		**Poor** Has had serious sicknesses, injuries and still suffers from them		**Very poor** Has chronic diseases/ is disabled	
		dP/dX	Sig.	dP/dX	Sig.	dP/dX	Sig.	dP/dX	Sig.	dP/dX	Sig.
Female	ster. logit	1.6%	0.752	-1.8%	0.725	0.4%	0.806	-0.1%	0.972	-0.1%	0.972
	ord. probit	0.7%	0.852	0.1%	0.853	-0.2%	0.852	-0.2%	0.852	-0.4%	0.852
Lives in Riga or Riga region	ster. logit	0.5%	0.914	4.6%	0.433	-1.7%	0.359	-1.4%	0.409	-2.1%	0.409
(ref. cat.: lives outside Riga region)	ord. probit	2.9%	0.441	0.5%	0.405	-1.0%	0.447	-1.0%	0.437	-1.5%	0.427
Lives in Riga or Riga region, male	ster. logit	**19.6%****	0.019	**-17.2%*****	0.004	2.1%	0.477	-1.8%	0.445	-2.7%	0.451
(dummy)	ord. probit	**12.0%***	0.057	0.6%	0.377	**-4.1%***	0.061	**-3.7%****	0.031	**-4.9%****	0.016
Age	ster. logit	**7.8%****	0.020	-5.0%	0.131	0.5%	0.647	-1.3%	0.244	-2.0%	0.243
	ord. probit	**5.4%****	0.030	**1.1%****	0.048	**-1.8%****	0.037	**-1.9%****	0.033	**-2.8%****	0.029
Age^2/100	ster. logit	**-21.47%*****	0.007	10.7%	0.181	-0.4%	0.886	**4.5%***	0.086	**6.6%***	0.084
	ord. probit	**-14.9%*****	0.010	**-3.0%****	0.026	**4.9%****	0.014	**5.2%****	0.013	**7.8%*****	0.010
Age^3/1000	ster. logit	**1.6%*****	0.006	-0.8%	0.209	0.0%	0.956	**-0.4%***	0.058	**-0.5%***	0.056
	ord. probit	**1.1%*****	0.010	**0.2%****	0.026	**-0.4%****	0.014	**-0.4%****	0.012	**-0.6%*****	0.010
Single	ster. logit	-3.9%	0.522	3.4%	0.644	-0.6%	0.803	0.4%	0.866	0.7%	0.866
(ref. cat: married or lives with a partner)	ord. probit	-2.0%	0.688	-0.4%	0.713	0.6%	0.684	0.7%	0.691	1.1%	0.698
Single, female	ster. logit	2.2%	0.798	-11.3%	0.117	3.5%	0.173	2.3%	0.527	3.4%	0.523
(dummy)	ord. probit	-1.6%	0.775	-0.4%	0.798	0.5%	0.773	0.6%	0.779	0.9%	0.784
Divorced or widowed , female	ster. logit	4.8%	0.500	**-21.5%*****	0.000	**6.5%*****	0.000	**4.1%***	0.099	**6.1%***	0.097
(dummy)	ord. probit	-5.9%	0.165	-1.7%	0.308	1.8%	0.146	2.2%	0.192	3.6%	0.232
Economically inactive	ster. logit	**-23.3%*****	0.000	**-10.6%***	0.063	2.5%	0.347	**12.7%*****	0.000	**18.7%*****	0.000
(ref. cat: employed / students)	ord. probit	**-21.5%*****	0.000	**-9.8%*****	0.000	**5.3%*****	0.000	**8.3%*****	0.000	**17.7%*****	0.000
Unemployed	ster. logit	-2.3%	0.757	-8.9%	0.195	3.1%	0.151	3.3%	0.284	4.8%	0.280
	ord. probit	-5.9%	0.256	-1.8%	0.412	1.8%	0.224	2.2%	0.288	3.7%	0.337
Ethnic non-Latvian	ster. logit	-2.2%	0.545	4.6%	0.236	-1.3%	0.291	-0.5%	0.685	-0.7%	0.684
	ord. probit	-0.2%	0.934	0.0%	0.935	0.1%	0.934	0.1%	0.935	0.1%	0.935
Below secondary education	ster. logit	8.1%	0.158	**-19.4%*****	0.000	**5.4%*****	0.002	2.4%	0.242	3.5%	0.239
(ref. cat: higher / incomplete higher education)	ord. probit	-1.6%	0.697	-0.3%	0.724	0.5%	0.696	0.6%	0.702	0.9%	0.707
Secondary / vocational secondary education	ster. logit	**6.8%***	0.075	-2.5%	0.584	-0.2%	0.909	-1.7%	0.256	-2.5%	0.263
	ord. probit	**5.0%***	0.095	1.0%	0.118	**-1.6%***	0.095	**-1.7%***	0.095	-2.6%	0.103

Notes: Asterisks *, **, *** indicate a statistically significant difference from the base group at 10%, 5%, 1% level respectively.
Other factors controlled: income

Table A 6. Impact of socioeconomic factors, life satisfaction and sense of control on health outcomes in Latvia

Factors	**Impact of each factor on health outcomes** (comparison with the reference category, impact of other factors is excluded)									
Mean probabilities	29%		32%		15%		10%		14%	
	Very good Never ails/ ails very rarely		**Good** Has had only minor sicknesses		**Fair** Has had serious sicknesses that are cured		**Poor** Has had serious sicknesses, injuries and still suffers from them		**Very poor** Has chronic diseases/ is disabled	
	dP/dX	Sig.	dP/dX	Sig.	dP/dX	Sig.	dP/dX	Sig.	dP/dX	Sig.
Female	11.7%	0.123	-1.8%	0.821	-1.1%	0.649	-3.6%	0.118	-5.1%	0.116
Lives in Riga or Riga region (ref. cat.: lives outside Riga region)	1.4%	0.789	3.0%	0.618	-1.3%	0.491	-1.3%	0.451	-1.8%	0.450
Lives in Rigaor Riga region, male (dummy)	**19.7%****	0.018	**-17.8%*****	0.004	2.4%	0.451	-1.8%	0.447	-2.5%	0.453
Age	**9.8%*****	0.003	**-5.9%***	0.086	0.5%	0.677	-1.9%	0.107	-2.6%	0.105
Age^2/100	**-25.6%*****	0.001	13.0%	0.115	-0.6%	0.861	**5.4%****	0.040	**7.7%****	0.039
Age^3/1000	**1.9%*****	0.001	-0.9%	0.132	0.0%	0.899	**-0.4%****	0.031	**-0.6%****	0.030
Single (ref. cat: married or lives with a partner)	-2.4%	0.708	1.7%	0.817	-0.2%	0.924	0.4%	0.881	0.6%	0.880
Single, female (dummy)	3.3%	0.697	-8.7%	0.260	2.6%	0.364	1.2%	0.723	1.7%	0.723
Divorced or widowed , female (dummy)	8.0%	0.289	**-20.1%*****	0.001	**5.9%*****	0.003	2.6%	0.298	3.6%	0.298
Economically inactive (ref. cat: employed / students)	**-20.4%*****	0.000	-9.9%	0.108	3.0%	0.251	**11.3%*****	0.000	**16.0%*****	0.000
Unemployed	9.3%	0.244	-8.6%	0.239	1.4%	0.566	-0.8%	0.697	-1.2%	0.697
Ethnic non-Latvian	-1.9%	0.604	6.1%	0.138	-1.9%	0.152	-1.0%	0.429	-1.3%	0.425
Below secondary education (ref. cat: higher / incomplete higher education)	**12.2%****	0.036	**-19.1%*****	0.000	**4.9%****	0.012	0.9%	0.641	1.3%	0.640
Secondary / vocational secondary education	**8.2%****	0.038	-2.5%	0.585	-0.4%	0.811	-2.2%	0.157	-3.1%	0.163
Average level of life satisfaction (ref. cat: low level of satisfaction)	**9.9%****	0.022	6.2%	0.187	**-3.7%****	0.033	**-5.1%*****	0.000	**-7.2%*****	0.000
High level of life satisfaction	**22.1%*****	0.005	-10.4%	0.123	-1.5%	0.574	**-4.2%****	0.020	**-5.9%****	0.019
High level of life satisfaction, female (dummy)	**-15.0%****	0.013	**33.3%*****	0.000	**-9.6%*****	0.002	-3.6%	0.118	-5.1%	0.113
Average level of control (ref. cat: low level of control)	**24.0%*****	0.002	-7.4%	0.307	-2.7%	0.331	**-5.7%*****	0.005	**-8.1%*****	0.002
High level of control	**14.6%****	0.033	7.8%	0.275	**-5.6%****	0.026	**-7.0%*****	0.001	**-9.8%*****	0.000
Average level of control, female (dummy)	**-14.2%***	0.051	-1.1%	0.916	1.0%	0.750	5.9%	0.155	8.4%	0.144
High level of control, female (dummy)	-7.2%	0.383	**-19.0%*****	0.010	**6.5%*****	0.010	**8.1%****	0.037	**11.5%****	0.032

Notes: Asterisks *, **, *** indicate a statistically significant difference from the base group at 10%, 5%, 1% level respectively.
Other factors controlled: income

Table A 7. Impact of socioeconomic factors and expectations on health outcomes in Latvia

Factors	**Impact of each factor on health outcomes** (comparison with the reference category, impact of other factors is excluded)									
Mean probabilities	29%		32%		15%		10%		14%	
	Very good Never ails/ ails very rarely		**Good** Has had only minor sicknesses		**Fair** Has had serious sicknesses that are cured		**Poor** Has had serious sicknesses, injuries and still suffers from them		**Very poor** Has chronic diseases/ is disabled	
	dP/dX	Sig.	dP/dX	Sig.	dP/dX	Sig.	dP/dX	Sig.	dP/dX	Sig.
Female	0.2%	0.969	3.1%	0.562	-1.0%	0.512	-0.8%	0.609	-1.5%	0.607
Lives in Riga or Riga region (ref. cat.: lives outside Riga region)	-3.3%	0.546	**11.7%***	0.076	**-3.3%***	0.092	-1.9%	0.289	-3.3%	0.286
Lives in Riga or Riga region, male (dummy)	**19.0%****	0.041	**-22.0%*****	0.000	4.0%	0.155	-0.4%	0.890	-0.7%	0.891
Age	**8.5%****	0.019	-5.1%	0.157	0.5%	0.688	-1.5%	0.208	-2.5%	0.206
Age^2/100	**-22.6%*****	0.009	10.4%	0.226	-0.4%	0.906	**4.6%***	0.083	**8.0%***	0.079
Age^3/1000	**1.7%*****	0.008	-0.7%	0.268	0.0%	0.979	**-0.4%***	0.059	**-0.6%***	0.056
Single (ref. cat: married or lives with a partner)	-2.4%	0.708	5.5%	0.480	-1.4%	0.552	-0.6%	0.799	-1.1%	0.799
Single, female (dummy)	2.7%	0.782	**-16.7%****	0.016	**4.8%****	0.036	3.4%	0.383	5.9%	0.374
Divorced or widowed , female (dummy)	7.0%	0.385	**-27.3%**	0.000	**7.6%*****	0.000	**4.6%***	0.083	**8.0%***	0.074
Economically inactive (ref. cat: employed / students)	**-24.0%*****	0.000	**-10.4%***	0.091	1.9%	0.521	**11.9%*****	0.000	**20.6%*****	0.000
Unemployed	-2.9%	0.699	-8.4%	0.252	2.7%	0.206	3.2%	0.299	5.5%	0.297
Ethnic non-Latvian	-1.8%	0.642	4.9%	0.250	-1.3%	0.275	-0.6%	0.593	-1.1%	0.589
Below secondary education (ref. cat: higher / incomplete higher education)	9.3%	0.123	**-17.8%*****	0.001	**4.4%*****	0.009	1.5%	0.431	2.6%	0.428
Secondary / vocational secondary education	**7.1%***	0.090	0.3%	0.958	-1.0%	0.517	-2.3%	0.114	-4.0%	0.117
Living standards of people like you in Latvia in 2-3 years... will improve (ref. cat: will become worse)	**11.8%****	0.026	-7.0%	0.141	0.5%	0.784	-1.9%	0.217	-3.3%	0.207
Will remain on the same level	1.6%	0.729	-1.0%	0.833	0.1%	0.933	-0.2%	0.862	-0.4%	0.862

Notes: Asterisks *, **, *** indicate a statistically significant difference from the base group at 10%, 5%, 1% level respectively.
Other factors controlled: income

Table A 8. Results of exogeneity test for level of life satisfaction (probit models for 2 dimensions of stereotype logit model)

Factors	**Impact of each factor on health** (comparison with the reference category, impact of other factors is excluded)			
	1st dimension		**2nd dimension**	
	dP/dX	Sig.	dP/dX	Sig.
Average level of life satisfaction (ref. cat: low level of satisfaction)	17.7%	0.808	-82.9%	0.151
High level of life satisfaction	-0.6%	0.991	-95.3%	0.040
Female	7.5%	0.683	-19.0%	0.333
Lives in Riga or Riga region (ref. cat.: lives outside Riga region)	32.0%	0.108	4.9%	0.833
Lives in Riga or Riga region, male (dummy)	-95.6%	0.001	-29.6%	0.343
Age	-25.5%	0.048	-30.1%	0.015
Age^2/100	66.4%	0.038	81.9%	0.006
Age^3/1000	-5.0%	0.044	-6.2%	0.005
Single (ref. cat: married or lives with a partner)	33.8%	0.130	14.0%	0.576
Single, female (dummy)	-55.7%	0.042	9.9%	0.754
Divorced or widowed , female (dummy)	-93.3%	0.002	-0.2%	0.992
Economically inactive (ref. cat: employed / students)	9.5%	0.749	82.9%	0.000
Unemployed	0.5%	0.987	-4.9%	0.887
Ethnic non-Latvian	8.9%	0.510	-20.4%	0.183
Below secondary education (ref. cat: higher / incomplete higher education)	-57.3%	0.004	-28.5%	0.201
Secondary / vocational secondary education	-13.3%	0.368	-19.0%	0.255
Constant	3.0	0.088	3.4	0.049
Instrumented: Level of live satisfaction Instruments: Gender, age, place of residence, labour status, income, marital status, ethnicity, education, **expectations on living standards in Latvia within 2-3 years in comparison to EU average, satisfaction with possibilities to implement personal ideas and plans**	Wald test of exogeneity: chi2(2) = 0.21 Prob > chi2 = 0.8985		Wald test of exogeneity: chi2(2) =1.57 Prob > chi2 = 0.4554	
Notes: Other factors controlled: income Dependent variable is binary in both dimensions: in the first dimension 0 is for very good health and 1 is for good health; in the second dimension 0 is for very good health and 1 is for fair, poor and very poor health combined together.				

Table A 9. Association between instrumental variables (expectations on living standards in Latvia within 2-3 years in comparison to EU average, satisfaction with possibilities to implement personal ideas and plans) and level of life satisfaction (ordered probit model)

Factors	dP/dX	Sig.
Will converge a little to EU average living standards (ref. cat.: Will lag behind EU average living standards even more)	17%	0.080
Will converge significantly to EU average living standards	15%	0.453
Will be about the same as EU average living standards	77%	0.001
Very unsatisfied with possibility to implement personal ideas and plans (ref. cat. rather satisfied)	-139%	0.000
Rather unsatisfied	-112%	0.000
Neither satisfied, nor unsatisfied	-54%	0.000
Very satisfied	92%	0.000

Table A 10. Results of exogeneity test for sense of control (probit models for 2 dimensions of stereotype logit model)

Factors	**Impact of each factor on health** (comparison with the reference category, impact of other factors is excluded)			
	1st dimension		**2nd dimension**	
	dP/dX	Sig.	dP/dX	Sig.
Average level of control (ref. cat: low level of control)	-149.2%	0.292	6.8%	0.964
High level of control	-90.8%	0.234	-104.7%	0.078
Female	-1.5%	0.935	-7.7%	0.705
Lives in Riga or Riga region (ref. cat.: lives outside Riga region)	5.1%	0.797	10.3%	0.640
Lives in Riga or Riga region, male (dummy)	-57.8%	0.047	-53.1%	0.080
Age	-27.9%	0.04	-31.2%	0.014
Age^2/100	69.5%	0.042	84.3%	0.006
Age^3/1000	-5.2%	0.054	-6.3%	0.007
Single (ref. cat: married or lives with a partner)	11.2%	0.630	16.4%	0.535
Single, female (dummy)	-33.0%	0.235	2.6%	0.935
Divorced or widowed , female (dummy)	-79.2%	0.009	-6.3%	0.817
Economically inactive (ref. cat: employed / students)	8.6%	0.741	60.4%	0.030
Unemployed	-22.7%	0.464	6.1%	0.879
Ethnic non-Latvian	2.3%	0.878	-9.2%	0.545
Below secondary education (ref. cat: higher / incomplete higher education)	-49.9%	0.018	-18.7%	0.409
Secondary / vocational secondary education	-27.5%	0.06	-28.7%	0.094
Constant	4.7	0.007	3.4	0.053
Instrumented: Level of perceived control over own life Instruments: Gender, age, place of residence, labour status, income, marital status, ethnicity, education, **satisfaction with own professional qualification, satisfaction with possibilities to implement personal ideas and plans**	Wald test of exogeneity: chi2(2) = 1.13 Prob > chi2 = 0.5686		Wald test of exogeneity: chi2(2) =1.79 Prob > chi2 = 0.4078	

Notes: Other factors controlled: income
Dependent variable is binary in both dimensions: in the first dimension 0 is for very good health and 1 is for good health; in the second dimension 0 is for very good health and 1 is for fair, poor and very poor combined together

Table A 11. Association between instrumental variables (satisfaction with personal professional qualification, satisfaction with possibilities to implement personal ideas and plans) and level of sense of control over own life (ordered probit model)

Factors	dP/dX	Sig.
Very unsatisfied with personal professional qualification (ref. cat. rather satisfied)	-53%	0.086
Rather unsatisfied	-17%	0.438
Neither satisfied, nor unsatisfied	-28%	0.124
Rather satisfied	-13%	0.407
Very unsatisfied with possibility to implement personal ideas and plans (ref. cat. rather satisfied)	-95%	0.001
Rather unsatisfied	-74%	0.000
Neither satisfied, nor unsatisfied	-51%	0.000
Very satisfied	65%	0.001

Table A 12. Results of exogeneity test for expectations (probit models for 2 dimensions of stereotype logit model)

Factors	**Impact of each factor on health** (comparison with the reference category, impact of other factors is excluded)			
	1st dimension		**2nd dimension**	
	dP/dX	Sig.	dP/dX	Sig.
Living standards of people like you in Latvia in 2-3 years... will improve (ref. cat: will become worse)	-42.8%	0.260	-59.5%	0.136
Will remain on the same level	27.6%	0.775	12.6%	0.887
Female	12.4%	0.557	-9.1%	0.662
Lives in Riga or Riga region (ref. cat.: lives outside Riga region)	26.1%	0.233	-8.0%	0.766
Lives in Riga or Riga region, male (dummy)	-93.1%	0.002	-16.7%	0.633
Age	-31.5%	0.022	-31.0%	0.018
Age^2	79.8%	0.020	83.7%	0.008
Age^3	-6.1%	0.025	-6.3%	0.008
Single (ref. cat: married or lives with a partner)	29.1%	0.216	1.8%	0.944
Single, female (dummy)	-53.1%	0.127	-7.3%	0.869
Divorced or widowed , female (dummy)	-92.3%	0.003	-1.2%	0.965
Economically inactive (ref. cat: employed / students)	34.4%	0.275	93.6%	0.001
Unemployed	4.5%	0.898	62.5%	0.101
Ethnic non-Latvian	10.9%	0.507	-22.3%	0.180
Below secondary education (ref. cat: higher / incomplete higher education)	-57.9%	0.017	-11.6%	0.612
Secondary / vocational secondary education	-19.7%	0.205	-17.5%	0.323
Constant	3.9	0.038	3.0	0.093
Instrumented: Level of live satisfaction Instruments: Gender, age, place of residence, labour status, income, marital status, ethnicity, education, **expectations on living standards in Latvia within 2-3 years in comparison to EU average, satisfaction with job possibilities in region one lives in**	Wald test of exogeneity: chi2(2) = 1.66 Prob > chi2 = 0.4360		Wald test of exogeneity: chi2(2) =1.58 Prob > chi2 = 0.4546	

Notes: Other factors controlled: income
Dependent variable is binary in both dimensions: in the first dimension 0 is for very good health and 1 is for good health; in the second dimension 0 is for very good health and 1 is for fair, poor and very poor health combined together.

Table A 13. Association between instrumental variables (satisfaction with job possibilities in the region, expectations on living standards in Latvia within 2-3 years in comparison to EU average) and level of sense of control over own life (ordered probit model)

Factors	dP/dX	Sig.
Will converge a little to EU average living standards (ref. cat.: Will lag behind EU average living standards even more)	-119%	0.000
Will converge significantly to EU average living standards	-166%	0.000
Will be about the same as EU average living standards	-61%	0.018
Very unsatisfied with job possibilities in the region (ref. cat. rather satisfied)	46%	0.007
Rather unsatisfied	43%	0.001
Neither satisfied, nor unsatisfied	30%	0.029
Very satisfied	-27%	0.151

Tables

Table 1. Impact of socioeconomic factors on health outcomes in Latvia[11]

Factors	**Impact of each factor on health outcomes** (comparison with the reference category, impact of other factors is excluded)				
Mean probabilities	29%	32%	15%	10%	14%
	Very good	**Good**	**Fair**	**Poor**	**Very poor**
	Never ails/ ails very rarely	Has had only minor sicknesses	Has had serious sicknesses that are cured	Has had serious sicknesses, injuries and still suffers from them	Has chronic diseases/ is disabled
Female	1.6%	-1.8%	0.4%	-0.1%	-0.1%
Lives in Riga or Riga region (ref. cat.: lives outside Riga region)	0.5%	4.6%	-1.7%	-1.4%	-2.1%
Lives in Riga or Riga region, male (dummy)	**19.6%****	**-17.2%*****	2.1%	-1.8%	-2.7%
Age	**7.8%****	-5.0%	0.5%	-1.3%	-2.0%
Age^2/100	**-21.4%*****	10.7%	-0.4%	**4.5%***	**6.6%***
Age^3/1000	**1.6%*****	-0.8%	0.0%	**-0.4%***	**-0.5%***
Single (ref. cat: married or lives with a partner)	-3.9%	3.4%	-0.6%	0.4%	0.7%
Single, female (dummy)	2.2%	-11.3%	3.5%	2.3%	3.4%
Divorced or widowed , female (dummy)	4.8%	**-21.5%*****	**6.5%*****	**4.1%***	**6.1%***
Economically inactive (ref. cat: employed / students)	**-23.3%*****	**-10.6%***	2.5%	**12.7%*****	**18.7%*****
Unemployed	-2.3%	-8.9%	3.1%	3.3%	4.8%
Ethnic non-Latvian	-2.2%	4.6%	-1.3%	-0.5%	-0.7%
Below secondary education (ref. cat: higher / incomplete higher education)	8.1%	**-19.4%*****	**5.4%*****	2.4%	3.5%
Secondary / vocational secondary education	**6.8%***	-2.5%	-0.2%	-1.7%	-2.5%

Notes: Asterisks *, **, *** indicate a statistically significant difference from the base group at 10%, 5%, 1% level respectively.
Other factors controlled: income

Table 2. Impact of socioeconomic factors on health outcomes in Latvia – comparison of results of two-dimensional stereotype logit model and ordered probit model[12]

Factors		**Impact of each factor on health outcomes**				
Mean probabilities		29%	32%	15%	10%	14%
		Very good	**Good**	**Fair**	**Poor**	**Very poor**
		Never ails/ ails very rarely	Has had only minor sicknesses	Has had serious sicknesses that are cured	Has had serious sicknesses, injuries and still suffers from them	Has chronic diseases/ is disabled
		dP/dX	dP/dX	dP/dX	dP/dX	dP/dX
Female	ster. logit	1.6%	-1.8%	0.4%	-0.1%	-0.1%
	ord. probit	0.7%	0.1%	-0.2%	-0.2%	-0.4%
Lives in Riga or Riga region	ster. logit	0.5%	4.6%	-1.7%	-1.4%	-2.1%
(ref. cat.: lives outside Riga region)	ord. probit	2.9%	0.5%	-1.0%	-1.0%	-1.5%
Lives in Riga or Riga region, male	ster. logit	**19.6%****	**-17.2%*****	2.1%	-1.8%	-2.7%
(dummy)	ord. probit	**12.0%***	0.6%	**-4.1%***	**-3.7%****	**-4.9%****
Age	ster. logit	**7.8%****	-5.0%	0.5%	-1.3%	-2.0%
	ord. probit	**5.4%****	**1.1%****	**-1.8%****	**-1.9%****	**-2.8%****
Age^2/100	ster. logit	**-21.47%*****	**10.7%**	-0.4%	**4.5%***	**6.6%***
	ord. probit	**-14.9%*****	**-3.0%****	**4.9%****	**5.2%****	**7.8%*****
Age^3/1000	ster. logit	**1.6%*****	-0.8%	0.0%	**-0.4%***	**-0.5%***
	ord. probit	**1.1%*****	**0.2%****	**-0.4%****	**-0.4%****	**-0.6%*****
Single	ster. logit	-3.9%	3.4%	-0.6%	0.4%	0.7%
(ref. cat: married or lives with a partner)	ord. probit	-2.0%	-0.4%	0.6%	0.7%	1.1%
Single, female	ster. logit	2.2%	-11.3%	3.5%	2.3%	3.4%
(dummy)	ord. probit	-1.6%	-0.4%	0.5%	0.6%	0.9%
Divorced or widowed , female	ster. logit	4.8%	**-21.5%*****	**6.5%*****	**4.1%***	**6.1%***
(dummy)	ord. probit	-5.9%	-1.7%	1.8%	2.2%	3.6%
Economically inactive	ster. logit	**-23.3%*****	**-10.6%***	2.5%	**12.7%*****	**18.7%*****
(ref. cat: employed / students)	ord. probit	**-21.5%*****	**-9.8%*****	**5.3%*****	**8.3%*****	**17.7%*****
Unemployed	ster. logit	-2.3%	-8.9%	3.1%	3.3%	4.8%
	ord. probit	-5.9%	-1.8%	1.8%	2.2%	3.7%
Ethnic non-Latvian	ster. logit	-2.2%	4.6%	-1.3%	-0.5%	-0.7%
	ord. probit	-0.2%	0.0%	0.1%	0.1%	0.1%
Below secondary education	ster. logit	8.1%	**-19.4%*****	**5.4%*****	2.4%	3.5%
(ref. cat: higher / incomplete higher)	ord. probit	-1.6%	-0.3%	0.5%	0.6%	0.9%
Secondary / vocational secondary	ster. logit	**6.8%***	-2.5%	-0.2%	-1.7%	-2.5%
education	ord. probit	**5.0%***	1.0%	**-1.6%***	**-1.7%***	-2.6%

Notes: Asterisks *, **, *** indicate a statistically significant difference from the base group at 10%, 5%, 1% level respectively.
Other factors controlled: income

Table 3. Impact of socioeconomic factors, life satisfaction and sense of control on health outcomes in Latvia[13]

Factors	**Impact of each factor on health outcomes** (comparison with the reference category, impact of other factors is excluded)				
Mean probabilities	29%	32%	15%	10%	14%
	Very good	**Good**	**Fair**	**Poor**	**Very poor**
	Never ails/ ails very rarely	Has had only minor sicknesses	Has had serious sicknesses that are cured	Has had serious sicknesses, injuries and still suffers from them	Has chronic diseases/ is disabled
	dP/dX	dP/dX	dP/dX	dP/dX	dP/dX
Female	11.7%	-1.8%	-1.1%	-3.6%	-5.1%
Lives in Riga or Riga region (ref. cat.: lives outside Riga region)	1.4%	3.0%	-1.3%	-1.3%	-1.8%
Lives in Rigaor Riga region, male (dummy)	**19.7%****	**-17.8%*****	2.4%	-1.8%	-2.5%
Age	**9.8%*****	**-5.9%***	0.5%	-1.9%	-2.6%
Age^2/100	**-25.6%*****	13.0%	-0.6%	**5.4%****	**7.7%****
Age^3/1000	**1.9%*****	-0.9%	0.0%	**-0.4%****	**-0.6%****
Single (ref. cat: married or lives with a partner)	-2.4%	1.7%	-0.2%	0.4%	0.6%
Single, female (dummy)	3.3%	-8.7%	2.6%	1.2%	1.7%
Divorced or widowed , female (dummy)	8.0%	**-20.1%*****	**5.9%*****	2.6%	3.6%
Economically inactive (ref. cat: employed / students)	**-20.4%*****	-9.9%	3.0%	**11.3%*****	**16.0%*****
Unemployed	9.3%	-8.6%	1.4%	-0.8%	-1.2%
Ethnic non-Latvian	-1.9%	6.1%	-1.9%	-1.0%	-1.3%
Below secondary education (ref. cat: higher / incomplete higher)	**12.2%****	**-19.1%*****	**4.9%****	0.9%	1.3%
Secondary / vocational secondary education	**8.2%****	-2.5%	-0.4%	-2.2%	-3.1%
Average level of life satisfaction (ref. cat: low level of satisfaction)	**9.9%****	6.2%	**-3.7%****	**-5.1%*****	**-7.2%*****
High level of life satisfaction	**22.1%*****	-10.4%	-1.5%	**-4.2%****	**-5.9%****
High level of life satisfaction, female (dummy)	**-15.0%****	**33.3%*****	**-9.6%*****	-3.6%	-5.1%
Average level of control (ref. cat: low level of control)	**24.0%*****	-7.4%	-2.7%	**-5.7%*****	**-8.1%*****
High level of control	**14.6%****	7.8%	**-5.6%****	**-7.0%*****	**-9.8%*****
Average level of control, female (dummy)	**-14.2%***	-1.1%	1.0%	5.9%	8.4%
High level of control, female (dummy)	-7.2%	**-19.0%*****	**6.5%*****	**8.1%****	**11.5%****

Notes: Asterisks *, **, *** indicate a statistically significant difference from the base group at 10%, 5%, 1% level respectively.
Other factors controlled: income

Table 4. Impact of socioeconomic factors and expectations on health outcomes in Latvia[14]

Factors	**Impact of each factor on health outcomes** (comparison with the reference category, impact of other factors is excluded)				
Mean probabilities	29%	32%	15%	10%	14%
	Very good Never ails/ ails very rarely	**Good** Has had only minor sicknesses	**Fair** Has had serious sicknesses that are cured	**Poor** Has had serious sicknesses, injuries and still suffers from them	**Very poor** Has chronic diseases/ is disabled
	dP/dX	dP/dX	dP/dX	dP/dX	dP/dX
Female	0.2%	3.1%	-1.0%	-0.8%	-1.5%
Lives in Riga or Riga region (ref. cat.: lives outside Riga region)	-3.3%	**11.7%***	**-3.3%***	-1.9%	-3.3%
Lives in Riga or Riga region, male (dummy)	**19.0%****	**-22.0%*****	4.0%	-0.4%	-0.7%
Age	**8.5%****	-5.1%	0.5%	-1.5%	-2.5%
Age^2/100	**-22.6%*****	10.4%	-0.4%	**4.6%***	**8.0%***
Age^3/1000	**1.7%*****	-0.7%	0.0%	**-0.4%***	**-0.6%***
Single (ref. cat: married or lives with a partner)	-2.4%	5.5%	-1.4%	-0.6%	-1.1%
Single, female (dummy)	2.7%	**-16.7%****	**4.8%****	3.4%	5.9%
Divorced, female (dummy)	7.0%	**-27.3%**	**7.6%*****	**4.6%***	**8.0%***
Economically inactive (ref. cat: employed / students)	**-24.0%*****	**-10.4%***	1.9%	**11.9%*****	**20.6%*****
Unemployed	-2.9%	-8.4%	2.7%	3.2%	5.5%
Ethnic non-Latvian	-1.8%	4.9%	-1.3%	-0.6%	-1.1%
Below secondary education (ref. cat: higher / incomplete higher education)	9.3%	**-17.8%*****	**4.4%*****	1.5%	2.6%
Secondary / vocational secondary education	**7.1%***	0.3%	-1.0%	-2.3%	-4.0%
Living standards of people like you in Latvia in 2-3 years... will improve (ref. cat: will become worse)	**11.8%****	-7.0%	0.5%	-1.9%	-3.3%
Will remain on the same level	1.6%	-1.0%	0.1%	-0.2%	-0.4%

Notes: Asterisks *, **, *** indicate a statistically significant difference from the base group at 10%, 5%, 1% level respectively.
Other factors controlled: income

Figures

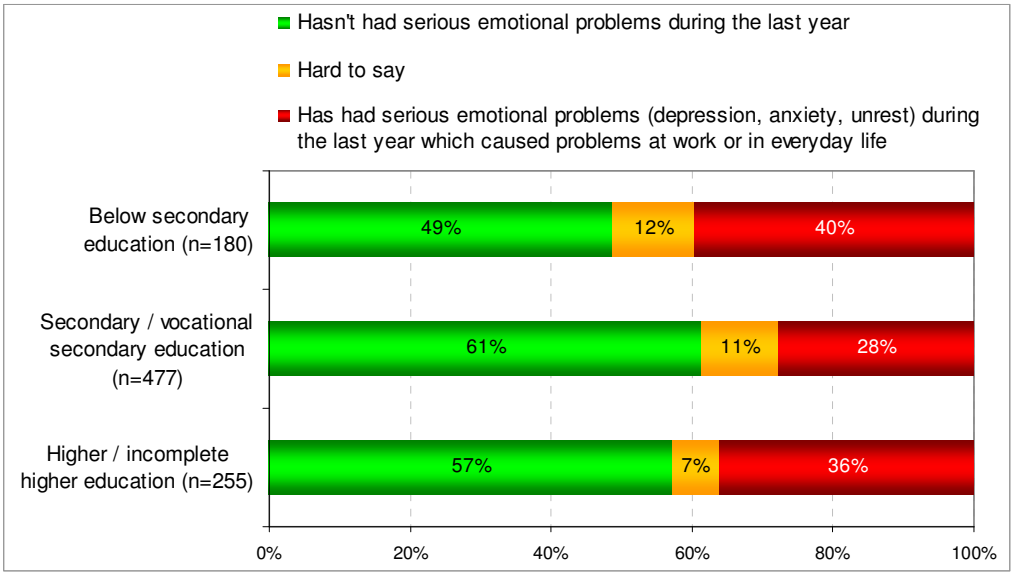

Figure 1. Exposure to serious emotional problems in different education groups, Latvia, 2008[15]

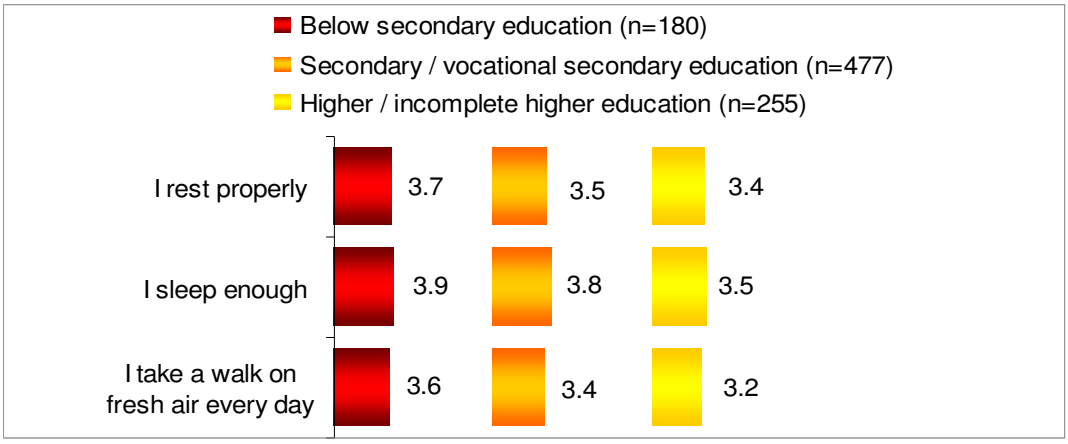

Figure 2. Evaluation of one's rest on a 5 point scale (1 – very rarely/never; 5 – always) in different education groups, Latvia, 2008[16]

Endnotes

[1] Author's calculations using "Life quality in Latvia 2005" survey data

[2] Officially recognized

[3] Satisfaction with present job/studies is not taken into account when counting average for nonworking retirees, housewives, disabled and unemployed who are not looking for job. For these respondents life satisfaction index was calculated as an average from the two remaining life domains

[4] Author's calculations using "Health Survey 2008" data

[5] The group includes nonworking retirees, women on a maternity leave, housewives and disabled

[6] 2nd quarter of 2008, official data

[7] 2nd quarter of 2009, official data

[8] Author's calculations using „NORBALT II" and „Health Survey 2008" data

[9] The survey was conducted in April 2008 and we expect the proportion of this group to increase in 2009

[10] Zujeva is former surname of the author

[11] Author's calculations using „Health Survey 2008" data

[12] Author's calculations using „Health Survey 2008" data

[13] Author's calculations using „Health Survey 2008" data

[14] Author's calculations using „Health Survey 2008" data

[15] Author's calculations using „Health Survey 2008" data

[16] Author's calculations using „Health Survey 2008" data